

L 26495-66 EWT(1)/EWT(m) IJP(c) JD/JG

ACC NR: AP6013056

SOURCE CODE: UR/0048/66/030/004/0581/0589

AUTHOR: Parfianovich, I. A.; Shuralova, Ye. I.; Pensina, E. E.; Krugauz, V. G. 76  
73  
B

ORG: Irkutsk State University (Irkutskiy gosudarstvennyy universitet)

TITLE: Roentgenluminescence of and trapping levels in NaCl and KCl crystals activated by Ag and Cu /Report, Fourteenth Conference on Luminescence held in Riga, 16-23 September 1965/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 4, 1966, 581-589

TOPIC TAGS: luminescence, thermoluminescence, luminescence center, sodium chloride, potassium chloride, crystal phosphor, ionizing radiation, roentgen luminescence, activated crystal, temperature dependence, electron trapping

ABSTRACT: One of the outstanding problems in the physics of ionizing radiations is elucidation of the mechanism of roentgenoluminescence (RL). Accordingly, the purposes of the present study were to investigate the RL mechanism in Ag-activated NaCl and KCl crystals and to obtain new, comparative data on RL of like crystals activated by Cu, in view of the similarity of this activator to Ag. The work included determination of the temperature dependence of the stationary RL and recording thermostimulated and light-stimulated emission curves. The experimental data are presented mainly in the form of graphs: plots of build-up of RL, temperature dependences of the RL and glow curves, Ausleuchtung curves, optical flash curves, and absorption curves. At temperatures

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ACC NR. AP6012056

above 100° C the RL spectra of all the phosphors have a principal peak associated with type I centers. NaCl:Ag and NaCl:Cu also exhibit an emission identified with type II centers. The KCl phosphors, however, in addition to the type I center luminescence, emit visible bands that cannot be identified with type II centers. In general, the stationary RL is made up of two components - a short-lived and a long-lived one - which are characterized by different relative intensities at different temperatures. The experimental data are analyzed at some length and some hypotheses are proposed. It is noted that the characteristic green phosphorescence of KCl:Ag is also observed, although in weaker form, in the case of "pure" KCl crystals. In view of the temperature range in which this green afterglow is evinced it is inferred that this emission is due to recombination of free electrons with  $V_K$  centers, for holes are immobilized at low temperatures. However, holes may participate in other forms of green luminescence. In general, there apparently participate in the roentgenoluminescence of alkali halide phosphors several different types of centers (including oxygen centers), some of which are more active in one temperature range, and some in another; both electron and hole processes are significant (above the temperature of self-trapping of holes), Orig. art. has: 5 figures.

SUB CODE: 20/

SUEN DATE: 00/

ORIG REF: 009/

OTH REF: 011

Card 2/2 02

26487-66 EWT(1)/EWT(m) IJP(c) JD/JG

ACC NR: AP6013057

SOURCE CODE: UR/0048/66/030/004/0590/0592

AUTHOR: Parfianovich, I. A.; Babin, P. A.; Shuraleva, Ye. I.

49  
B

ORG: Irkutsk State University (Irkutskiy gosudarstvennyy universitet)

TITLE: Some peculiarities of the <sup>27</sup>roentgenoluminescence of <sup>27</sup>NaCl and <sup>27</sup>KCl crystals activated by Ag and Cu /Report, Fourteenth Conference on Luminescence held in Riga, 16-23 September 1965

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 30, no. 4, 1966, 590-592

TOPIC TAGS: luminescence, potassium chloride, sodium chloride, crystal phosphor, x ray effect, *temperature dependence, roentgenoluminescence, electron trapping*

ABSTRACT: Investigations by the authors and others have shown that NaCl and KCl phosphors doped with Ag and Cu exhibit some peculiarities as regards build-up of their roentgenoluminescence (RL) and the temperature dependence of the RL. In the series of experiments first described the phosphor specimens were first x irradiated to attainment of a steady RL intensity, i.e., to "saturation"; then the radiation was cut off for a period (dark pause), and then again turned on. The measurement results are presented in the form of growth curves; it was found that whereas in the case of both NaCl:Ag and NaCl:Cu the second growth curve is virtually identical with the initial one, in the case of KCl phosphors the dark pause results in initial intensification of

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the RL, that is, instead of the gradual rise characteristic of the initial irradiation (and of the NaCl phosphors) the emission abruptly rises to a sharp peak that is substantially above the steady RL level and then gradually falls off to the steady level (in some cases with a slight preliminary dip). This effect is temperature dependent and disappears about 308°K. This would imply that the "flash" effect is due to some sort of trapping centers that dissociate at this temperature; the possible nature of these centers is discussed in general terms. Further experiments involved study of the temperature dependence of the RL and recording of glow curves after x-ray excitation. Here again the curves for the NaCl and KCl phosphors are different; KCl:Cu, for example, is characterized by strong increase in the RL intensity in the temperature region of quenching of the photoluminescence excited in the range of the long-wavelength absorption band. Some possible reasons for this phenomenon are suggested, but admittedly these are not the only ones that may be hypothesized. In conclusion, it is inferred that in the range of higher temperatures, where trapping of current carriers is unlikely and RL is the only detectable form of recombination luminescence, there occurs a change in the mechanism of excitation energy transfer to the luminescence centers. Orig. art. has: 2 figures.

SUB CODE: 20/

SUM DATE: 00/

ORIG REF: 002/

OTH REF: 000

Cord 2/2 h

PARFIANOVICH, I.A.; PENZINA, E.E.; PENZIN, Yu.G.

Luminescence of excited silver centers in the crystal phosphors NaCl -  
Ag and NaBr - Ag. Izv. vys. ucheb. zav.; fiz. 8 no.2:150-155 '65.  
(MIRA 18:7)

1. Irkutskiy gosudarstvennyy universitet imeni Zhdanova.

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.; DOBRZHANSKIY, G.F.; MAGARIL, I.G.;  
KAZINTSEVA, M.D.

Some data on the luminescent properties of NaCl - Eu and KCl - Eu  
phosphors. Izv. AN SSSR. Ser.fiz. 29 no.3:409-411 Mr '65.  
(MIRA 18:4)

1. Irkutskiy gosudarstvennyy universitet.

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.; BABIN, P.A.; IVAKHNENKO, P.S.

Activator absorption of NaCl - Pb and KCl - Pb phosphors. Izv.  
AN SSSR. Ser.fiz. 29 no.3:417-419 Mr '65.

~~Some data~~ on the properties of induced activator centers in  
NaCl - Ag and KCl - Ag phosphors. Ibid.:427-430

(MIRA 18:4)

1. Irkutskiy gosudarstvennyy universitet i Khabarovskiy  
gosudarstvennyy pedagogicheskiy institut.

PARFIANOVICH, I.A.; POLOGRUDOV, V.V.

Memory effect of the action of an electric field in alkali halide  
phosphors. Izv. AN SSSR. Ser.fiz, 29 no.3:490-492 Mr '65.  
(MIRA 18:4)

1. Irkutskiy gosudarstvennyy universitet.



PARFIANOVICH, I.A.; PENZINA, E.E.; PENZIN, Yu.G.

Photoluminescence of ionic and induced luminescence centers in  
KBr - Ag single crystals. Izv. vys. ucheb. zav.; fiz. 8 no.16  
94-98 '65. (MIRA 18-3)

1. Irkutskiy gosudarstvennyy universitet imeni Shdanova.

PARFIANOVICH, I.A.; PENZINA, E.E.; PENZIN, Yu.G.

Induced luminescence of alkali halide phosphors activated by  
silver. Izv. AN SSSR. Ser.fiz. 29 no.3:431-433 Mr '65.  
(MIRA 184)

1. Irkutskiy gosud.rstvennyy universitet.

PARFIANOVICH, I.A.; SHURALEVA, Ye.1.

Color centers and centers of recombination luminescence in  
alkali halide phosphors. Izv. AN SSSR Ser. fiz. 29 no.1:  
19-26 Ja '65. (MIRA 18:2)

1. Irkutskiy gosudarstvennyy universitet.

PARFIANOVICH, I.A.; KRONGAUZ, V.G.; SHURALEVA, Ye.I.

Roentgenoluminescence and optical flash of NaCl - Ni phosphor.  
Izv. AN SSSR Ser. fiz. 29 no.1:43-45 Ja '65. (MIRA 18:2)

1. Irkutskiy gosudarstvennyy universitet.

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.; KRONGAUZ, V.G.

Luminescence of "pure" alkali halide crystals. Izv. AN SSSR Ser.  
fiz. 29 no.1:59-62 Ja '65. (MIRA 1P:2)

1. Irkutskiy gosudarstvennyy universitet.

L 43916-65 EWT(1) PI-4 IJP(c)

ACCESSION NR: AP5009518

S/0048/65/029/003/0431/0431

AUTHOR: Parfianovich, I.A.; Penzina, E.E.; Penkin, Yu. G.

TITLE: Induced luminescence of silver-activated alkali halide phosphors (Report, 12th Conference on Luminescence held in L'vov, 30 Jan-3 Feb 1964)

SOURCE: AN SSSR. Izvestiya. Seriya Khimicheskaya, v. 29, no. 3, 1965, 431-433

TOPIC TAGS: luminescence, alkali halide, silver, color center, luminescent crystal, x ray irradiation

ABSTRACT: The authors investigated the luminescence of NaCl, KBr, and NaBr phosphors activated with 1 mole percent silver. These phosphors are known to have two types of activator centers: type I, responsible for the short wavelength luminescence, and type II, responsible for a longer wavelength luminescence. The phosphors can be colored by additives or by irradiation with ionizing radiation, whereupon a number of absorption bands appear. In the present work the nature of the B and C centers is investigated. B centers were induced in KBr by x-ray irradiation. The phosphorescence found by M.L.Kats and V.N.Nikol'skiy (Sb.

Fizika shchelochnogoldnykh kristallov, p. 183. Izd. Latv. un-ta, Riga, 1962

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ACCESSION NR: AP5009518

for additive induced B centers was also found in the case of the x-ray induced B centers. The phosphorescence was excited both by B band radiation and by F band radiation, and the afterglow intensity was found to be strongly temperature dependent. The B centers were optically unstable. All these results are regarded as supporting the recombination mechanism for B center emission, proposed by Kats and Nikol'skiy (loc. cit.). C centers were induced in NaCl:Ag phosphors by x-irradiation. The C center concentration was found to increase on heating or storage of x-ray irradiated phosphors, from which it is concluded that ionic processes are involved. The C centers are thermally the most stable of all the induced color centers, and crystals were prepared containing practically no other induced centers. The behavior of these crystals confirmed the close relation between C centers and type II activator centers proposed by R.I.Gindina and Ch.B.Lushchik (Tr. In-ta fiz. i. astron. AN EstSSR, no. 5, 81 (1961)). X-ray irradiation was found to reduce the luminescence from type II centers, while simultaneously increasing that from C centers, and destruction of C centers by heating was found to lead to a partial restoration of the type II center concentration. C center emission could be excited not only by C band radiation (310 mμ) but also by 245 mμ radiation, and the behavior of the emission band did not depend on how it was excited. This

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ACCESSION NR: AP5009518

behavior is not understood; it is suggested that transfer of energy to the O center is involved. A similar short wavelength band was observed in the O center excitation spectrum of NaBr:Ag phosphors. Further experimentation is indicated. Orig. ext. has: 3 figures.

ASSOCIATION: Irkutskiy gosudarstvennyy universitet (Irkutsk State University)

SUBMITTED: 00/ --Mir55

ENCL: 00

SUB CODE: OP, SS

MI REF SOV: 003

OTHER: 001

Card 8/8 16



L 40271-65 EWT(1)/EWT(m)/EWP(t)/EWP(z)/EWP(b) Pad/P1-4 IJP(c) JD/EW  
 ACCESSION NR: AP5009529 S/0048/65/029/003/0490/0492

AUTHOR: Parfianovich, I.A.; Pologrudov, V.V.

TITLE: On the memory effect in the action of an electric field on the luminescence of alkali halide phosphors /Report, 12th Conference on Luminescence held in L'vov, 30 Jan-5 Feb 1964/

SOURCE: AN SSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 3, 1965, 490-492

TOPIC TAGS: luminescence, luminescent crystal, x ray, electric field, sodium chloride, nickel, potassium compound, bromine compound, indium

ABSTRACT: The authors have investigated the effect of pre-exposure to an electric field on the roentgenoluminescence of KBr:In and NaCl:Ni phosphors. The crystal phosphors were subjected to a  $1-5 \times 10^5$  V/cm electric field between electrodes with which they were not in contact and were subsequently excited by 20 keV x-rays. In the case of the KBr:In phosphors the duration of exposure to the electric field was varied from a few seconds to several minutes. Five seconds after the field was removed the exciting x-rays were applied and the time variation of the resulting luminescence was followed. The initial intensity of the lumin-

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ACCESSION NR. AP5009529

escence was much (up to 11 times) greater than without previous exposure to an electric field. This luminescence decayed rapidly at first, (half-time several tens of seconds) but subsequently increased and reached a maximum one or two minutes after the beginning of the excitation. As a function of duration of exposure to the electric field, the initial intensity of the fluorescence increased rapidly, reached a maximum for an exposure of the order of a few seconds, and decreased with further increase of the exposure. The luminescence intensity at the subsequent maximum increased monotonically with duration of exposure to the electric field. The NaCl:Ni phosphors were exposed to the electric field for 6 min and subsequently excited to luminescence by x-ray pulses of 2 sec duration. The intensity of the luminescence flashes was greater when the phosphor was previously exposed to the electric field than when it was not. The maximum intensity of the luminescence flashes was reached approximately one minute after exposure to the field. Orig. art. has: 3 figures.

ASSOCIATION: Irkutskiy gosudarstvenny universitet (Irkutsk State University)

SUBMITTED: 00

ENCL: 00

SUB CODE: OP, SS

NR REF SOV: 004

OTHER: 003

Card 8/8

L 43911-65 EPP(c)/EPP(n)-2/EPA(s)-2/ENT(1)/IWT(m)/EWP(b)/EWP(t) P1-4/Pr-4/Pt-7/  
 Pu-1 IJP(c) JD/JG S/0048/85/029/003/0409/0411  
 ACCESSION NR AP5009514

AUTHOR: Parlanovich, I.A.; Shuraleva, Ye.L.; Dobrzanskiy, G.F.; Magaril, I.G.  
Kazintseva, M.D.

TITLE: Some data on the luminescent properties of europium activated sodium chloride and potassium chloride phosphors [Report, 12th Conference on Luminescence held in L'vov, 30 Jan-5 Feb 1984]

SOURCE: AN BSSR. Izvestiya. Seriya fizicheskaya, v. 29, no. 3, 1985, 409-411

TOPIC TAGS: fluorescence, fluorescent crystal, sodium chloride, potassium compound, europium, x ray irradiation, F center

ABSTRACT: NaCl:Eu and KCl:Eu crystals were grown from melts containing from 0.1 to 3 mole percent europium and their luminescence properties were investigated. Excitation spectra, emission spectra, and glow curves were recorded and the effects on these of various heat treatments and irradiation with 50 keV x-rays and F-band light were investigated. It is indicated that interesting peculiarities have been found, for the explanation of which further accumulation of experimental facts is required. Among these interesting peculiarities were the following. The excitation bands of NaCl:Eu at 245 and 335 mμ appeared to be due to

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L 13911-65

ACCESSION NR. AP5009514

single type of luminescence center, in agreement with the views of Ya.Ya. Kirs and A.I. Niylik (Tr. In-ta fiz. i astron. AN Est SSR, No. 8, 36 (1962)), but a band at 265 mμ, distinguished by its behavior under heat treatment, appeared to be due to a second type of center. Centers of this second type did not occur in KCl:Eu. Irradiation with x-rays greatly reduced the luminescence of both materials; this effect was fully reversible in KCl:Eu, the luminescence being restored by a 300°C anneal, but only partly reversible in NaCl:Eu. Irradiation with x-rays also led to the formation of F centers; the F band in NaCl:Eu was much wider than in pure NaCl. The light sum stored in NaCl:Eu was reduced by x-ray irradiation, and the structure of its glow curve was somewhat altered. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Irkutskiy gosudarstvennyy universitet (Irkutsk State University)

SUBMITTED: 00

ENCL: 00

SUB CODE: Op, 88

NR REF SOV: 001

OTHER: 000

Card 2/2 *mb*

PARFIANOVICH, I.A.; KRONGAUZ, V.G.; SHURALEVA, Ye.I.

Effects of the increase in brightness of optical flashes in pure  
NaCl crystals. Izv.vys.ucheb.zav.; fiz. no.3:66-70 '63.

(MIRA 16:12)

1. Irkutskiy gosudarstvenny universitet imeni Zhdanova.

L 19504-63 EWA(h)/EWT(1)/EWP(q)/EWT(m)/EWP(B)/BDS AFFTC/ASD/APGC/  
AFWL/IJP(C)/SSD WW/JD  
ACCESSION NR: AT3002242 5/2941/63/001/000/0317/0320

AUTHORS: Parfianovich, I. A.; Pologrudov, V. V. 2/

TITLE: X-ray electroluminescence of alkali-halide monocrystalline phosphors

SOURCE: Optika i spektroskopiya; sbornik statoy. v. 1: Lyuminestsentsiya.  
Moscow, Izd-vo AN SSSR, 1963, 317-320

TOPIC TAGS: electroluminescence, excitation, electric field, activator

ABSTRACT: A detailed study was made of the x-ray electroluminescence of the monocrystalline phosphors NaCl, NaCl-Cu, KBr, KBr-In<sup>+</sup>, KBr-In<sup>3+</sup>, KJ, and KJ-Tl. The specimens were in form of plates placed between a copper electrode and a metallic screen to which a sinusoidal voltage was applied, from 50 cycles to 21 k-cycles at 0 to 1100 volts. It was found that luminescence brightness and the phosphorescence of these alkaline-halides, under x-ray excitation, changed with the variable electric field. Data was obtained relating this effect to the voltage and frequency of the applied field, radiation wave length, and activator concentration. It is shown that the electric field can both enhance and reduce luminescence brightness. Orig. art. has: 4 figures and 2 tables.

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L 16863-63

EWI(1)/EWP(q)/EWI(m)/BDS/EEC(b)-2 AFPTC/ASD/ESD-3 Pad/

PI-4 JD/HW

ACCESSION NR: AR3006311

S/0058/63/000/007/D082/D083

SOURCE: RZh. Fizika, Abs. 7D599

68

AUTHOR: Parfianovich, I. A.; Shuraleva, Ye. I.

TITLE: Role of structural defects in the glow of NaCl-Ni phosphors

CITED SOURCE: Sb. Fiz. shchelochno-galoidn. kristallov. Riga, 1962, 206-210. Diskus., 210

TOPIC TAGS: phosphor, alkali-halide crystal, structural defect, NaCl-Ni

TRANSLATION: NaCl-Ni crystals grown from a melt and prepared from natural rock salt by electrolysis have been investigated. The excitation spectra, the effect of heating on the excitation spectra, the storage of the light suns in x-ray and photoexcitation were investigated. It is concluded that in phosphors activated by the

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ACCESSION NR: AR3006311

electrolysis method, the luminescence centers of Ni are localized on dislocations and represent ions of monovalent nickel. N. Maksimova.

DATE ACQ: 15Aug63

SUB CODE: PH

ENCL: 00

Card 2/2



PARFIANOVICH, I.A.; SHURALEVA, Ye.I.; KRONGAUZ, V.G.

New data on the thermal and optical stability of M-centers.  
Opt. i spektr. 14 no.4:513-515 Ap '63. (MIRA 16:6)

(Crystals—Thermal properties)  
(Crystals—Optical properties)

I 19722-63 EWP(1)/BDS/EEC(b)-2 AFFTC/ASD/IJP(C)/SSD PI-4

ACCESSION NR: AT3002218

8/2941/63/001/000/0185/0189

AUTHORS: Farfianovich, I. A.; Sharalova, Ye. I.; Krongauz, V. G. 63

TITLE: On complex mechanism of flash stimulated by F-band absorption in NaCl 21 27

SOURCE: Optika i spektroskopiya; sbornik statey. v. 1: Lyuminesatsiya. Moscow, Izd-vo AN SSSR, 1963, 185-189

TOPIC TAGS: F-band, absorption, irradiation, optical flash

ABSTRACT: F-band absorption study was made of the change in optical flash brightness in pure crystalline NaCl after being stimulated by x-rays (50 kv 18 ma) at room temperature. The change in flash intensity and the absorption coefficient was obtained both by pulse stimulation and continuous irradiation. The results are depicted in Fig. 1 (see enclosure). The change in flash brightness is related to the presence of blocking centers in the crystal and to an intermediate process necessary for radiation recombination. The rise in optical flash brightness under pulse stimulation is also explained by the phenomenon of the thermal decay of these blocking centers. Orig. art. has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 19 May 63

ENCL: 01

SUB CODE: PH

NO REF SOV: 002

OTHER: 000

Card 1/2

S/051/63/014/004/010/026  
E039/E420

AUTHORS: Parfianovich, I.A., Shuraleva, Ye.I., Krongauz, V.G.

TITLE: New data on the thermal and optical stability of  
M centers

PERIODICAL: Optika i spektroskopiya, v.14, no.4, 1963, 513-515

TEXT: The aim of the work is to obtain a more detailed elucidation of the connection of the first peak of the thermal luminescence curve with the M absorption band. A complex study of the optical and thermal disintegration of F and M centers is carried out in parallel with photo and thermal stimulation of luminescence in phosphors excited by X radiation. Pure NaCl crystals and NaCl-Ni and NaCl-Tl phosphors are used. It is shown that the first peak of the thermal luminescence curve is not connected with M centers but depends somehow on other centers which are noticeably less thermally stable than M centers. On the other hand it is evident that M centers always exist in crystals when F centers are present. This is understandable on the basis of H.Pick's model (Zs. Phys., v.159, 1960, 69) according to which M centers are formed from two F centers situated along the (110) axis. It is  
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S/051/63/014/004/010/026  
E039/E420

New data on the thermal ...

known (B. Faraday et al, Phys. Rev., Letters, v.7, 1961, 57) that in crystals excited by X-rays at liquid nitrogen temperature and heated up to room temperature that the concentration of M centers increases almost 50 times on account of their formation from F centers. This process probably occurs when phosphors irradiated with X-rays at room temperature are heated up to 100°C. At this temperature the formation and destruction of M centers will occur simultaneously. There are 2 figures.

SUBMITTED: July 9, 1962

Card 2/2

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.

Characteristics of the luminescence and structure of certain  
alkali halide phosphors. Izv. AN SSSR. Ser. fiz. 26 no.4:  
497-505 Ap '62. (MIRA 15:4)

1. Irkutskiy gosudarstvennyy universitet im. A.A.Zhdanova.  
(Alkali metal halides--Spectra) (Luminescence)

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.; KATS, M.L.

Discussion of the reports of I.A.Parfianovich and E.I.Shuraleva  
and M.L.Kats. Izv. AN SSSR. Ser. fiz. 26 no.4:513 Ap '62.  
(MIRA 15:4)

1. Odesskiy gosudarstvennyy universitet.  
(Alkali metal halides--Spectra)

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.

Correlation of the values of the optical and thermal light sums  
in NaCl-Ni phosphor. Opt.i spektr. 10 no.5:680-681 My '61.  
(MIRA 14:8)

(Phosphors) (Photoelectric measurements)

S/048/62/026/004/009/014  
B104/B102

AUTHORS: Parfianovich, I. A., and Shuraleva, Ye. I.  
TITLE: Particularities of luminescence and the structure of some  
alkali-halide phosphors  
PERIODICAL: Akademiya nauk SSSR. Izvestiya. Seriya fizicheskaya,  
v. 26, no. 4, 1962, 497-505

TEXT: This review article deals with investigations carried out in the years 1928-61, with special regard to the role played by dislocations in the recombination luminescence of NaCl-Cu and NaCl-Ni phosphors grown from melts or from NaCl crystals by electrolysis or diffusion. The luminescence properties of various phosphors differ greatly, depending on the specific features of their structure. Regardless of the absence of ionization of the luminescent centers by exciting irradiation, some crystals luminesce as a result of direct recombination of electrons with luminescent centers, while other crystals possess the luminescence characteristic of ion activator centers. This kind of luminescence is

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Particularities of luminescence ...

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B104/B102

not due to recombination. There are 7 figures.

ASSOCIATION: Irkutskiy gos. universitet im. A. A. Zhdanova  
(Irkutsk State University imeni A. A. Zhdanov)

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PARFIANOVICH, I.A.; SHURALEVA, Ye.I.

Detailed study of the mechanism of the luminescence of NaCl - Ni  
phosphors. Izv.vys.ucheb.zav.; fiz. no.1:94-97 '61. (MIRA 14:7)

1. Irkutskiy gosudarstvennyy universitet imeni Zhdanova.  
(Sodium chloride) (Luminescence)

PARFIANOVICH, I.A.; SHURALEVA, Ye. I.

Details of the mechanism of the optical flash, stimulated by  
light from the band region. Opt. i spektr. 10 no.4:500-504  
Ap '61. (MIRA 14:3)  
(Phosphors—Optical properties)

20840

S/048/61/025/003/023/007  
B104/B201

24.3500 (1138,1153,1395)

AUTHORS: Parfianovich, I. A. and Shuraleva, Ye. I.

TITLE: Study of the photodecay of F-centers in alkali halide crystals

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 3, 1961, 383-384

TEXT: This paper was presented at the 9th conference on luminescence (crystal phosphors), Kiev, June 20 to 25, 1960. The authors studied the optical scintillation and the decay of F-centers in pure and activated NaCl crystals in order to explain the mechanism of photodecay of the F-centers. The F-centers were produced by means of X-rays; light from the F-bands was used to decolorate the crystals. It could be proved that the weakening of the F-band under the action of light is caused by the transformation of the F-centers into other electron centers (M or F<sup>+</sup>-centers). After a certain limit concentration of the electrons is attained at the flat decay levels, decay ceases. This is illustrated by the results graphically shown in Fig. 1. This diagram shows the relative change of

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B104/B202

Study of the photodecay of...

the concentration of the F-centers in a pure NaCl crystal where curve 1 was taken after exposure to X-rays and curve 2 after heating to 700°C for seven minutes. Curve 1 consists of two parts. The first part characterizes the rapid decay of the F-centers, the second one ceasing of the decay. It could be shown in an NaCl-Ni crystal that the introduction of an activator reduces the stability of the F-centers. Fig. 2 shows the relative changes of the concentrations of the F-centers on photodecay for one and the same NaCl-Ni crystal for different times of exposure to X-rays. Curve 1 holds for a 20-minute-irradiation. Curve 2 for a 5-hour-irradiation. The authors infer the existence of two different F-centers from the shape of these curves. Also in NaCl-Cu phosphor a decrease in the stability of the F-centers with increasing activator concentration could be observed. The activator absorption band with  $\lambda_m = 255 \text{ m}\mu$  in these phosphors is weakened by heating, whereas the stability of the F-centers increases. This result leads to the assumption that the stability of the centers not only influences that part of the activator which is distributed in the cationic nodes of the fundamental lattice but also that which lies in the especial points of the crystal. This part of the activator ions can be relatively easily displaced by heating the crystal. There are

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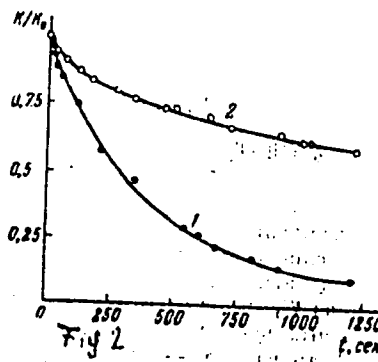
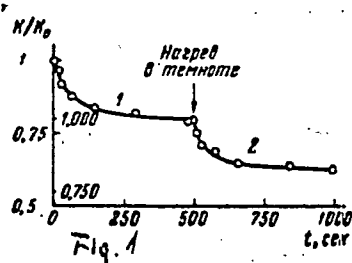
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S/048/61/025/003/029/047  
B104/B202

Study of the photodecay of...

2 figures and 7 references: 2 Soviet-bloc and 4 non-Soviet-bloc.

ASSOCIATION: Irkutskiy gos. universitet im. A. A. Zhdanova (Irkutsk State University imeni A. A. Zhdanov)



Card 3/3

89700

24,3500 (1137,1138,1163,1469)

S/139/61/000/001/008/018  
E073/E335

AUTHORS: Parfianovich, I.A. and Shuraleva, Ye.I.

TITLE: Investigation of Details of the Mechanism of  
Luminescence of NaCl-Ni Phosphors

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika,  
1961, No. 1, pp. 94 - 97

TEXT: The luminescence of the NaCl-Ni phosphors produced by electrothermal diffusion is generated by means of filtered light from a mercury arc lamp. The brightness of the luminescence will be the higher the greater the activator concentration. The luminescent properties of this phosphor are not stable; with increasing temperature the brightness decreases and in contrast to other crystal phosphors the process is irreversible. Similar changes occur as a result of X-ray irradiation. However, in the latter case, the luminescence does not disappear entirely and this is attributed to the fact that X-ray irradiation does not only destroy existing centres of luminescence but it also creates new ones. Such formation of centres of induced luminescence in NaCl-Ni

Card 1/6

X

89700

Investigation of ....

S/139/61/000/001/008/018  
E073/E335

phosphors grown from a melt was observed by M.L. Kats and B.Z. Semenov (Ref. 2: Dokl. Ak. nauk SSSR, 106, 415, 1956), who established that the crystals were not phosphorescent immediately after they were produced. However, after X-ray irradiation they would emit light if they were excited by illumination of a wavelength of  $\lambda = 365 \text{ m}\mu$ ; the above authors consider that this represents luminescence of atomic centres. The experiments of the authors of this paper have shown that this luminescence is not pure fluorescence and is composed of induced fluorescence and optical flashes. The authors investigated separately these two types of illumination in NaCl-Ni phosphors grown from melts as well as produced by means of electrothermal diffusion. The latter were first heated for the purpose of destroying the primary centres of luminescence. It was found that the brightness of induced luminescence depended on the dose of X-ray irradiation. Fig. 2 gives the results of tests with four different specimens; Curves 1 and 2 relate to synthetic phosphors, whereby for one (Curve 1) the Ni concentration was twice as high as for the

✓

Card 2/6



89700

Investigation of ...

S/139/61/000/001/008/018  
E073/E335

other (Curve 2); Curves 3 and 4 characterise the increase in brightness of induced luminescence for crystals activated by the method of electrothermal diffusion. Curve 4 applies to the specimen with the minimum Ni-concentration. It is characteristic for all the curves that in the initial stage the brightness is highest for crystals with the lowest activator content. All the curves show a tendency to saturation, which is achieved the more quickly the lower the activator concentration. In investigating the initial brightness of flashes, generated under the influence of light from the F-absorption band, as a function of the concentration of F-centres, new relations were discovered. The results of these experiments are given in Fig.3 (brightness of the optical flashes in the initial instant  $I$  versus absorption coefficient in the F-band maximum, which is a measure of the concentration of the F-centres). The numbering of the curves has the same meaning as for Fig.2. The influence of activator concentration can be seen clearly since the bend in the curve will occur the sooner the lower the activator content of the crystal. Equal

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89700

Investigation of ...

S/139/61/000/001/008/018  
E073/E335

anomalous behaviour is observed in the variation of the magnitude of the optical sum of light as a function of the X-ray irradiation time. This is attributed to the fact that with increasing X-ray irradiation time, there is a decrease in the number of Ni centres, the interaction of which with the electrons leads to the formation of optical flashes. In order to verify this assumption, the authors observed the change in brightness of NaCl-Ni phosphors during the process of excitation with X-rays. Usually, with increasing accumulation of electrons at the capture level, there is a gradual increase in the brightness of excited phosphors. However, the authors have observed a different picture in NaCl-Ni phosphors: in a beam of X-rays the brightness does not increase with the progress of time but decreases and becomes continuously weaker with increasing doses of X-ray irradiation. It is probable that thermal destruction of illumination centres is due to a hole mechanism; with the cessation of electron and hole centres, the initial state of the phosphor is re-established in which all the Ni centres are in the ionised state.

Card 4/6

Investigation of ....

S/139/61/000/001/008/018  
EO73/E335

There are 3 figures and 3 Soviet references.

ASSOCIATION: Irkutskiy gosuniversitet imeni A.A. Zhdanova  
(Irkutsk State University imeni A.A. Zhdanov)

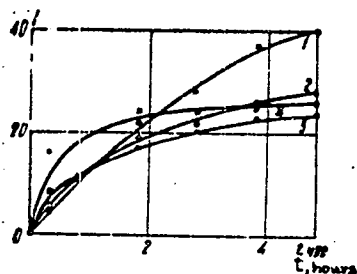
SUBMITTED: June 13, 1960

Card 5/6

89700

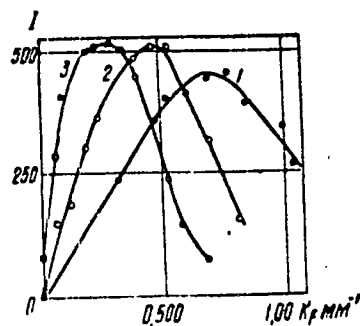
Investigation of ....

Fig. 2:



S/139/61/000/001/008/018  
E073/E335

Fig. 3:



Card 6/6

89240

S/048/61/025/001/006/031

B029/B067

9.6150 (01501395)

AUTHORS: Parfianovich, I. A. and Shuraleva, Ye. I.

TITLE: Characteristic features of the damping mechanism of optical flash-up

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, v. 25, no. 1, 1961, 38-42

TEXT: The authors present some interesting results obtained when studying the dependence of the damping rate of optical flash-up on the damping of X-radiation, and the increase of brightness of this flash-up with interrupted action of the illuminating light. First, the known experimental data and their possible explanations are briefly discussed. Fig. 2 shows the change of the ratio between the initial brightness  $I_0$  of flash-up and its final brightness  $I_1$ , as well as the ratio between the brightness of flash-up after the electrons are set free from the shallow levels and the corresponding value at the end of the preceding period of illumination ( $I_2/I_1$ ). These two ratios increase with the X-radiation dose. The

Card 1/5

✓

89240

Characteristic features of the damping ...

S/048/61/025/001/006/031  
B029/B067

blocking effect of the M-centers is not sufficient for an explanation of these phenomena, for which also the mechanism of recombination luminescence in NaCl-Ni-phosphors has to be taken into account. Data on this mechanism were obtained by studying the changes in the initial brightness of flash-up and in the optical light sums with the time of exposure to X-rays. Fig. 3 shows the dependence of the initial brightness of flash-up on the concentration of F-centers for the three crystals nos. 1, 2, and 3. All three curves have maxima which are formed the earlier, the less the amount of activator in the crystal. The dependence of the change of the optical light sum on the time of exposure of the phosphors to X-rays is analogous. The total thermal light sums increase with increasing time of exposure to X-rays. In an X-ray beam, the luminescence of an NaCl-Ni phosphor decreases with time. With increasing X-ray dose it becomes weaker. Recombination luminescence may occur due to both recombination of the electrons with the ionization centers of luminescence and recombination of the electrons with the hole-type centers of the basic material. No agreement can be obtained between the rules established in the present paper and sensitized luminescence. Recombination luminescence in NaCl-Ni phosphors is caused by ionized luminescing centers. These ionized centers are

Card 2/5

89240

Characteristic features of the damping ... S/048/61/025/001/006/031  
B029/B067

assumed to have existed in the NaCl-Ni phosphors already before excitation. Exposure to X-rays reduces the number of ionized centers, and their recombination with free electrons leads to different luminescence phenomena. The dependence of the damping rate of the optical flash-up and of the increase of its brightness with interrupted action of the illuminating light on the X-radiation dose can be explained as follows: 1) reduced probability of recombination of free electrons with ionized luminescing centers due to the blocking effect of M-centers; 2) reduction of the number of ionized luminescing centers during exposure to X-rays. The ratio of optical light sum to thermal light sum depends on the activator concentration and, for a given sample, also on the degree of phosphor excitation. This is the reproduction of a lecture read at the Ninth Conference on Luminescence (Crystal Phosphors), Kiyev, June 20-25, 1960. There are 3 figures, 2 tables, and 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Irkutskiy gosudarstvennyy universitet im. A. A. Zhdanova  
(Irkutsk State University imeni A. A. Zhdanov)

Card 3/5

89240

Characteristic features of the damping ...

S/048/61/025/001/006/031  
B029/B067

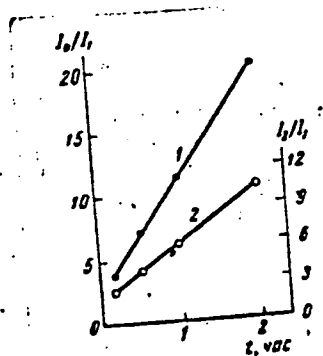


Fig. 2

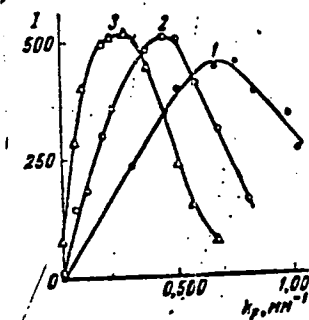


Fig. 3

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89240

Characteristic features of the damping ...

S/048/61/025/001/006/031  
B029/B067

Table 1

№ кристалла	$k_{\text{дм}}, \text{см}^{-1}$	20°C			70°C		
		$S_{\text{опт}}$	$\Delta S_T$	$\Delta S_T/S_{\text{опт}}$	$S_{\text{опт}}$	$\Delta S_T$	$\Delta S_T/S_{\text{опт}}$
1	2	3	4	5	6	7	8
1	8,80	820	20	0,02	820	9,3	0,01
2	6,40	500	41	0,08	825	18,5	0,02
3	2,20	260	92	0,35	468	54,0	0,11
4	0,60	88	134	1,52	134	48,0	0,36

Legend to Table 1:

Degree of optical illumination of NaCl-Ni phosphors of different activator concentrations. Subscript T denotes thermal, опт optical.

Card 5/5

PARFIANOVICH, I.A.; SHURALEVA, Ye.I.

Activator trapping centers and activator luminescence centers  
in alkali halide phosphors. Izv.vys.ucheb.zav.; fiz. no.5:  
139-147 '59. (MIRA 13:4)

1. Irkutskiy gosuniversitet imeni A.A.Zhdanova.  
(Alkali halides) (Phosphors)

PARFIANOVICH, I. A. Doc Phys-Math Sci -- (russ) "Luminescence and centers of coloration of X-ray-excited alkali-haloid phosphori." Mos, 1958  
17 pp (Mos Order of Lenin and Order of Labor Red Banner State Univ im M. V. Lomonosov. Phys Faculty), 150 copies (KL, 2-58, 97)

SCV/51-7-4-13/32

AUTHORS: Parfianovich, I.A. and Shuraleva, Ye.I.

TITLE: The Effect of an Activator on the Stability of F-Centres.

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 4, pp 518-523 (USSR)

ABSTRACT: Optical decomposition (bleaching) of F-centres in pure NaCl crystals and in NaCl activated at 680-760°C with nickel or copper was studied. Crystals were coloured photochemically at room temperature using X-rays from a tube with a tungsten anode working at 50 kV. Optical measurements were carried out using spectrophotometers SF-4 and SF-2m. Fig 1 shows optical decomposition of F-centres in pure (curve 1), heated (curve 2) and nickel-activated ( $3 \times 10^{-4}$  mol.% Ni, cf. curve 3) NaCl crystals. The ordinates represent the relative change in the F-centre concentration and the abscissae show the duration of action of light of 465 mμ wavelength. Fig 1 shows that decomposition of F-centres occurs fastest in the presence of an activator. Stability of F-centres is also lowered, but to a smaller extent, by heating of the crystal. Further measurements on NaCl samples with various amounts of nickel show that the rate of bleaching increases with increase of the activator concentration. Similar effects were observed when NaCl was activated with copper (cf. a table on p 519). In order to elucidate the mechanism of

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SOV/51-7-4-13/32

**The Effect of an Activator on the Stability of F-Centres**

F-centre decomposition the authors studied changes in the absorption spectra of X-irradiated NaCl (F and M electron bands, V hole band) produced by illumination of pure or activated crystals with 465 mμ, i.e. with the wavelength at which F-band occurred. The results are shown in Figs 2-7. Analysis of Figs 2-7 shows that the high stability of F-centres in pure crystals is due to formation of predominantly hole centres, with very small effective recombination cross-section, on X-ray irradiation of NaCl. Activation produces favourable conditions for formation of hole centres which do not require additional energy to recombine with electrons at room temperature. The role of the activator as a direct acceptor of electrons is of little importance. The authors reject Oberly's hypothesis (Ref 14) of the existence of two types ("soft" and "hard") of F-centres. The authors ascribe different optical stabilities of F-centres to the external conditions and not to the differences in the nature of F-centres. There are 7 figures, 1 table and 14 references, 1 of which is Soviet, 10 English and 3 German.

SUBMITTED: February 7, 1959

Card 2/2

PARFIANOVICH, I.A.

Electron trap levels of the activator in the phosphor NaCl-H1.  
Opt. 1 spektr. 6 no.2:189-193 F '59. (MIRA 12:4)  
(Phosphors) (Electrons---Capture)

PARFIANOVICH, I.A.

Stimulating action of X rays. Opt. 1 spektr. 5 no.5:612-614  
N '58. (MIRA 11:12)  
(X rays) (Alkali halide crystals)

SOV/51-6-2-10/39

AUTHOR: Parfianovich, I.A.

TITLE: ~~On Electron-Capture Levels of the Activator in the NaCl-Ni Phosphor~~  
(Ob aktivatornykh urovnyakh zakhvata elektronov v NaCl-Ni-fosfore)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 2, pp 189-193 (USSR)

ABSTRACT: The author reports some results of his investigation of the role of the activator electron-capture levels compared with F-levels in NaCl-Ni. The phosphors used were activated by electrothermal diffusion. Natural rocksalt crystals were used as the base. The phosphors were excited by means of X-rays from a tube with a tungsten anode (50 kV, 18 mA) at room temperature. The optical absorption spectra were measured by means of a SF-4 spectrophotometer. Distribution of electrons in capture levels may be deduced from the spectra of additional absorption, in which each band corresponds to a particular type of centres. Fig 1 gives the additional absorption spectrum of NaCl-Ni excited with X-rays. Immediately after X-ray irradiation there are five characteristic bands in the spectrum (Fig 1, curve 1). Two of these are electron bands (F and M) and one hole V-band; all three are due to the properties of the base (NaCl) itself. Two other bands at 276 and 308 mμ are due to the activator (nickel). After illumination with F-band wavelengths

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SOV/51-5-2-10/39

## On Electron-Capture Levels of the Activator in the NaCl-Ni Phosphor

the intensity of this band decreases because of partial decomposition and the 276 and 308 mμ bands are strengthened (Fig 1, curve 2). This shows clearly that the 276 and 308 mμ bands are due to electron centres. Such centres are formed by capture of electrons by the activator ions. By comparing the areas under the absorption bands the author deduces that only 5% of the total number of electrons localized by means of X-rays are captured by the activator ions. The rest are presumably captured by anion vacancies in the NaCl lattice. It is found that only a small portion of the total amount of the activator ions present in the phosphor is effective as electron acceptors. They become such acceptors under special conditions, e.g. when coupled to anion vacancies. The author reports that such behaviour is also observed

Card 2/3

SOV/51-5-2-10/39

On Electron-Capture Levels of the Activator in the NaCl-Ni Phosphor

When other activators are used. Relationship between probabilities of localization of electrons at impurity (activator) levels and at capture levels of the base (NaCl), is discussed, and the effect of the activator levels on the afterglow kinetics is dealt with. There are 2 figures and 22 references, 14 of which are Soviet, 1 translation and 7 English.

SUBMITTED: March 3, 1958

Card 3/5

SOV/51-5-5-17/23

AUTHOR: Parfianovich, I.A.

TITLE: On the Stimulating Action of X-Rays (O vysvechivayushchem deystvii rentgenovskikh luchey)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 5, pp 612-614 (USSR)

ABSTRACT: Free electrons, produced by the action of X-rays in alkali-halide phosphors, are localized both at the capture centres of the halide itself and at the activator centres. Distribution of electrons in energy levels of capture centres may be found by determining the spectrum of additional absorption due to the action of X-rays. Curve 1 in the figure on p 612 gives such a spectrum for NaCl-Ni, irradiated with X-rays until a steady state (saturation) is reached in the additional absorption. This spectrum consists of two electron bands (F- and M-bands) and a hole band (V-band), which are all characteristic of NaCl itself. Two electron bands at 276 and 308 mμ are due to centres which form on localization of electrons at the activator. In NaCl-Ni irradiated to saturation with X-rays the activator capture levels are not completely filled. The incomplete filling is confirmed by illuminating an X-irradiated NaCl-Ni crystal with F-band light. The results are shown by curve 2: the

Card 1/2

On the Stimulating Action of X-Rays

SOV/51-5-5-17/23

F-band is destroyed and the 276 and 308 mμ bands, which are due to localized electrons at the activator centres, are strengthened. This incompleteness of filling of the activator levels and of the capture levels of NaCl itself is known as the stimulating action of X-rays. The effect is due to the limited number of levels being available for localization of holes. Equal numbers of holes and electrons are created by the action of X-rays, but the number of the centres which can capture holes is smaller than the number of the electron capture centres. Once all the hole levels are filled the remaining holes recombine with free electrons preventing complete filling of the electron-capture levels. There are 1 figure and 5 references, 4 of which are Soviet.

SUBMITTED: March 12, 1958.

Card 2/2 1. Alkali-halide phosphors--Effects of radiation 2. Electron capture  
3. X-ray--Properties 4. Nickel-sodium chloride--Spectra 5. Nickel  
-sodium chloride--Electron transitions

PARPIANOVICH, I.A.

Interaction of electrons with activator NaCl-Ni and NaCl-Cu  
phosphors. Opt. i spektr. 4 no.5:692-695 My '58. (MIRA 11:6)

1.Irkutskiy gosudarstvennyy universitet.  
(Electrons) (Phosphors)

~~PARFIANOVICH, I.A.~~

Influence of an activator on electron-trapping levels. Opt. i  
spektr. 4 no.2:253-256 F '58. (MIRA 11:4)

1. Irkutskiy gosudarstvennyy universitet.  
(Alkali metal halides) (Phosphors)

AUTHOR: Parfianovich, I.A.

51-4-5-23/29

TITLE: On Interaction of Electrons with the Activator in NaCl-Ni and NaCl-Cu Phosphors (O vzaimodeystvii elektronov s aktivatorom v NaCl-Ni i NaCl-Cu forforakh)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 5, pp. 692-695 (USSR,

ABSTRACT: The present paper deals with investigation of interaction of electrons with the activator in electrochemically activated phosphors NaCl-Ni and NaCl-Cu prepared from natural rock-salt crystals. The phosphors were excited with X-rays (50 kV, 18 mA) at room temperature. The absorption spectra were measured using a SF-4 spectrophotometer. Introduction of Ni or Cu into NaCl produces absorption bands in the ultraviolet region (Fig 1). Fig 2 shows the spectrum of additional absorption produced by X-ray irradiation of a pure NaCl crystal. This additional absorption consists of two electron bands (F and M) and one wide hole V-band. Fig 3, 1, shows the additional absorption produced by X-rays in NaCl-Ni. As in pure NaCl, F-bands and V-bands are observed but they are now more intense. In addition to F-bands and V-bands, new absorption bands are observed in NaCl-Ni. These new bands are due to the activator and their wavelengths are: 234, 253, 276, 308 and

Card 1/3

51-4-5-23/29

On Interaction of Electrons with the Activator in NaCl-Ni and NaCl-Cu Phosphors

340 mμ (Fig 3, 1). On optical de-excitation of the F-band the 276 and 308 mμ bands are intensified (Fig 3, 2). This suggests that the 276 and 308 mμ bands are of electron nature. The centres responsible for these bands consist of electrons and activator ions (the latter have acceptor levels for electrons). Comparison of the additional absorption spectra produced by X-rays in NaCl-Ni and NaCl-Ag (Ref 11) shows that these spectra are very similar. The additional absorption produced by X-rays in NaCl-Cu differs somewhat from the corresponding spectra of NaCl-Ni and NaCl-Ag. In NaCl-Cu there are bands at 212, 234, 290 and 335 mμ (Fig 4, 1). The first three of these bands are intensified on de-excitation of the F-band. In all the three phosphors discussed in the present paper the activator possesses acceptor levels for electrons and capture of electrons at these levels produces various types of centres. Composition of these centres is not limited to activator ions and electrons. As in pure crystals, where structural defects have acceptor levels for electrons, combinations of activator ions with structural defects in activated crystals may produce new acceptor levels. Formation of such

Card 2/3



On Interaction of Electrons with the Activator in NaCl-Ni and NaCl-Cu Phosphors 51-4-5-23/29

centres produces new absorption bands described above. The author thanks E.I. Shuraleva for help in this work. There are 4 figures and 16 references 8 of which are Soviet, 6 American and 2 German.

ASSOCIATION: Irkutskiy gosudarstvennyy universitet (Irkutsk State University)

SUBMITTED: October 17, 1957

1. Phosphors - Excitation
2. Phosphors - Absorption
3. Electrons - Interaction

Card 3/3

PARFIANOVICH, I. A.

AUTHOR: Parfianovich, I.A.

51-5-7/26

TITLE: On the Energy of Thermal Ionisation of Trapping Centres in Alkali Halide Phosphors. (Ob energii teplovoy ionizatsii tsentrov zakhvata v shchelochno-galoidnykh fosforakh)

PERIODICAL: Optika i Spektroskopiya, 1957, Vol.2, Nr 5, pp.592-598 (USSR)

ABSTRACT: Under the action of X-rays on alkali halide phosphors as well as on non-activated halide crystals, F-centres are formed. The maximum of thermoluminescence curve which occurs at the highest temperatures corresponds to those centres. From the parameters of this maximum the energy of thermal ionisation of F-centres can be found. This paper reports such a study using NaCl crystals and NaCl-Ni phosphors. Activation with Ni was carried out electrolytically at two different temperatures: 973 and 1033°K. The samples were of 1 mm thickness and were excited by X-rays. The excitation was carried out both at room and at higher temperatures. The methods and the apparatus were the same as in previous work (Ref.9). The thermoluminescence curve for the NaCl-Ni phosphor excited at room temperature has two maxima (Fig.1, curve 1). The second of these maxima corresponds to the F-band. The curves 2 and 3 in Fig.1 refer to

Card 1/3

51-5-7/26

On the Energy of Thermal Ionisation of Trapping Centres in Alkali Halide Phosphors.

activated at 1033°K,  $\epsilon = 1.02$  eV and  $p_0 = 3.1 \times 10^9 \text{sec}^{-1}$ .

Experiments were also carried out using natural crystals of rock-salt. The results are shown in Fig.4. Curve 1 refers to a crystal of NaCl excited at 373°K, curve 2 was obtained after irradiation with F-band light at room temperature. The results of calculations for natural crystals of NaCl are given in Table 2 ( $\epsilon = 1.72$  eV,  $p_0 = 6 \times 10^{14} \text{sec}^{-1}$ ). The occurrence of the F-band in crystals of natural rock-salt after X-ray irradiation indicates presence of ionic vacancies in the crystals. Artificial NaCl crystals obtained by melting of the rock-salt were also studied. For the latter crystals  $\epsilon = 1.05$  eV and  $p_0 = 3.2 \times 10^9 \text{sec}^{-1}$ . These results agree well with the values obtained for the NaCl-Ni phosphor activated at a temperature near the melting point (1033°K). In Table 3 the theoretical and experimental values of  $\epsilon$  for the natural rock-salt are compared. They are all about 2 eV. There are 4 figures, 3 tables and 16 references, of which 10 are Slavic.

SUBMITTED: October 6th, 1956.

AVAILABLE: Library of Congress.

Card 3/3

~~PARPIANOVICH, I.A.~~

On effects observable when alkali halide phosphors are exposed to  
intermittent light. Izv. AN SSSR. Ser. fiz. 21 no.4:536-537 Ap '57.  
(MLRA 10:8)

1. Irkutskiy gosudarstvennyy universitet imeni A.A. Zhdanova.  
(Luminescence) (Phosphors)

PARFIANOVICH, I.A.

Thermal ionization energy of capture centers in alkali halide  
phosphors. Izv. AN SSSR. Ser. fiz. 21 no.4:589-590 Ap '57.

(MLRA 10:3)

1. Irkutskiy gosudarstvennyy universitet imeni A.A. Zhdanova.  
(Luminescence) (Phosphors)

AUTHOR: Parfianovich, I. A.

51-3-20/24

TITLE: On effects observed in alkali-halide phosphors under the action of intermittent light. (Ob effektaKh, nablyudayemykh pri preryvnom deystvii sveta na shchelochno-galoidnye fosfory).

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy), 1957, Vol.2, No.3, pp.392-395 (U.S.S.R.)

ABSTRACT: KCl:Tl phosphor was excited with X-rays. On irradiation with light in the F-band it was found that some 50 seconds after the light irradiation had ceased the phosphorescent intensity rose to a maximum and then slowly decreased. When intermittent F-band illumination was employed on KCl:Tl it was found that during each illumination period the emission intensity fell with time. Each time illumination was started again the intensity was higher than at the end of the previous illuminated period. Heating to 40 C during the dark periods caused thermoluminescence and a pronounced increase of the emission intensity at the beginning of the next illuminated period. Similar effects occurred in NaCl:Ni excited with X-rays. This time, however, heating during the dark periods was necessary to obtain, at the beginning of an illuminated period (In KCl:Tl this effect occurred also at room temperature).

Card 1/2

On effects observed in alkali-halide phosphors under the  
action of intermittent light. (Cont.) 51-3-20/24

For both these phosphors the explanation is the same. During  
the dark periods trapping centres formed by the action of  
X-rays are destroyed (at room temperature in KCl:Tl and on  
heating in NaCl:Ni) and electrons are freed by the action of  
F-band illumination and/or heating. There are 6 figures and  
2 references both of which are Slavic.

SUBMITTED: October 6, 1956.

AVAILABLE:

Card 2/2

PARFIANOVICH I. A.

SUBJECT: USSR/Luminescence

48-4-21/48

AUTHOR: Parfianovich I. A.

TITLE: On Effects Observed at Discontinuous Action of Light on Alkali-Haloid Phosphors (Ob Effekтах, nablyudayemykh pri preryvistom deystvii sveta na shche lochno-galoidnyye fosfory)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, #4, pp 536-537 (USSR)

ABSTRACT: Under action of X-rays at room temperature electron centers of various thermal stability are formed in alkali-haloid phosphors KBr-Ni, KCl-Tl and NaCl-Ni. F-centers are the most stable among them.

All these phosphors produce a flash of light under the action of light from the region of the F-band.

An effect of increasing the brightness of flash after a dark pause was discovered during investigations of luminescence at discontinuous action of light from the region of the F-band. This effect was observed in KCl-Tl-phosphor at the room temperature. The intensity of the effect rises with heating the

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**TITLE:**

48-4-21/48  
On Effects Observed at Discontinuous Action of Light on Alkali-Haloid Phosphors (Ob effektakh, nablyudayemykh pri preryvistom deystvii sveta na shche lochno-galoidnyye fosfory)

phosphor during the dark pause.

In NaCl-Ni-phosphor this effect is observed only after heating up to 100°C followed the switching off the excitation light.

The change in luminescence intensity is ascribed to the change of electron concentration in the conduction zone and/or the change of concentration of ionized luminescent centers.

The report was followed by a short discussion. No references are cited.

**INSTITUTION:** Irkutsk State University im. Zhdanov

**PRESENTED BY:**

**SUBMITTED:** No date indicated.

**AVAILABLE:** At the Library of Congress.

Card 2/2

PARFIANOVICH, I A

48-4-39/48

SUBJECT: USSR/Luminescence

AUTHOR: Parfianovich I.A.

TITLE: On the Energy of Thermal Ionization of Capture Centers in Alkali-Haloid Phosphors (Ob energii teplovoy ionizatsii tsentrov zakhvata v shchelochno-galoidnykh fosforakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, #4, pp 589-590 (USSR)

ABSTRACT: The energy of thermal ionization is one of the most important characteristics of electronic capture centers in semiconductors and crystallophosphors. This quantity is determined from the relation:

$$p = p_0 e^{-\epsilon/kT}$$

where: p is the probability of thermal ionization of an electronic center per unit of time;

$p_0$  is frequency factor;

$\epsilon$  is the energy of thermal ionization.

Card 1/2 The  $\epsilon$ -value for crystallophosphors is determined by data

**TITLE:**

On the Energy of Thermal Ionization of Capture Centers in<sup>48-4-39/48</sup>  
Alkali-Haloid Phosphors (Ob energii teplovoy ionizatsii  
tsentrov zakhvata v shchelochno-galoidnykh fosforakh)

obtained in studies of the temperature-dependence of  
luminescence.

An investigation of process kinetics in NaCl-Ni phosphor  
activated at 700°C has shown that repeated electron captures  
of electrons during thermal luminescence can be neglected.  
The following values were found for the centers corresponding  
to the last peak in this phosphor luminescence:  $\epsilon = 1.4$  eV  
and  $p_0 = 6.3 \times 10^{12}$  sec<sup>-1</sup>.

Similar investigations of NaCl natural crystals led to the  
following results for F-centers:  $\epsilon = 1.72$  eV and  $p_0 = 6.3 \times 10^{14}$   
sec<sup>-1</sup>. These results can be considered as near to the true  
characteristics of F-centers in NaCl.  
No references are cited.

**INSTITUTION:** Irkutsk State University im. Zhdanov

**PRESENTED BY:**

**SUBMITTED:** No date indicated

**AVAILABLE:** At the Library of Congress.

Card 2/2

PARFIANOVICH, Ye.M. [Parfianovych, IE.M.]

Methods for instruction and training in sanatoria for children with pulmonary tuberculosis. Ped., akush. i gin. 20 no.6:30-32 '58.

(MIRA 13:1)

1. Detskaya klinika (ispolnyayushchiy obyazannosti zav. klinikoy - kand.med.nauk P.G. Lebedeva) Instituta im. Sechenova (direktor - prof. S.R. Tatevosov).

(CHILDREN--HOSPITALS)

(TUBERCULOSIS--HOSPITALS AND SANATORIALS)

L 54740-65 FSS-2/EWT(1)/FCC/EEC(t)/EWA(h)

Po-4/Pq-4/Pae-2/Peb/Pi-4 GN

ACCESSION NR: AP5015673

UR/0293/65/003/003/0457/0468  
551.510.3

AUTHOR: Mikhnevich, V. V.; Golubev, Ye. N.; Parfianovich, Yu. N.

TITLE: Preliminary results of determining particle concentration and atmospheric density on 18 June 1963

SOURCE: Kosmicheskiye issledovaniya, v. 3, no. 3, 1965, 457-468

TOPIC TAGS: atmospheric density, satellite mission analysis, geophysical satellite, solar activity, atmospheric particle concentration, quiet sun, ultraviolet radiation

ABSTRACT: Analyses of the results are presented for manometer determinations of atmospheric densities and particle concentrations at altitudes between 120 and 360 km made on 18 June 1963. The vehicle used was a high-altitude automatic geophysical station (VGAS) which was 1 m in diameter, weighed about 360 kg, and carried 5 (2 ionization and 3 electric discharge magnetic) manometers in addition to amplifying apparatus. The arrangement of the manometers in the satellite is shown in Fig. 1 of the Enclosure. A description is given of the satellite's trajectory and operation. The solar radio-emission flux at the time of flight (according to

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L 54740-65

ACCESSION NR: AP5015673

the Ottawa Observatory, Canada) was  $82 \cdot 10^{-22} \text{ w} \cdot \text{m}^{-2} \text{ cps}^{-1}$ . Manometer readings were interpreted using the method described by A. I. Ivanovskiy and A. I. Repnev (Tr. Tsentral. Aerol. Observ., no. 56, 1964). An analysis of the dependence of the formulas used to determine particle concentrations and densities on temperature showed that the faster the instruments moved, the more accurate the readings became. Under the conditions of this experiment, the effect of manometer sensitivity on the readings is explained and analyzed. The error in the determination of the orientation angle between the apparatus and the vector of the flux velocity was about  $3^\circ$ . Figs. 2 and 3 show graphically the results obtained. It was found that at an altitude of over 200 km, atmospheric density diminishes with diminution in solar activity, but below this altitude the effect of the solar activity is inconsequential. Orig. art. has: 10 figures, 3 tables, and 16 formulas. [ER]

ASSOCIATION: none

SUBMITTED: 10Jun64

NO REF SOV: 008

ENCL: 02

OTHER: 006

SUB CODE: ES, SV

ATD PRESS: 4030

Card 2/4

L 54740-55

ACCESSION NR: AP5015673

ENCLOSURE: 01

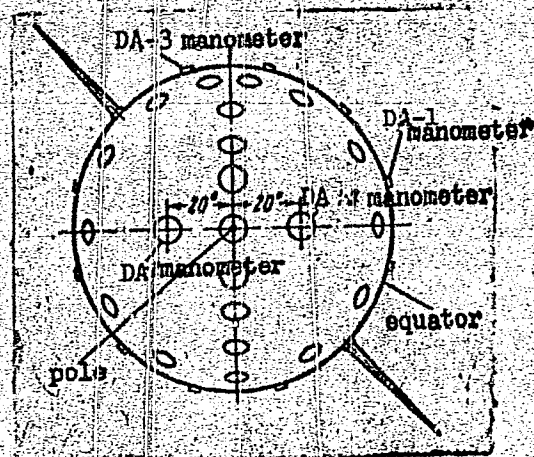


Fig. 1. Distribution of manometers in VGAS satellite

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L 54740-65  
ACCESSION NR: AP5015673

ENCLOSURE: 02

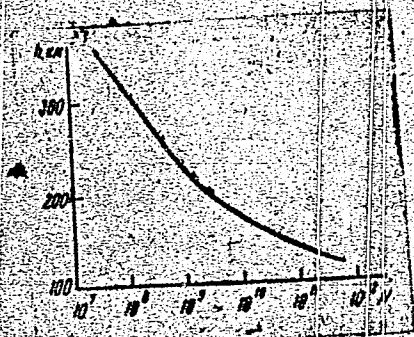


Fig. 2. Particle concentration at altitudes of 120--350 km on 18 June 1963, at 4:30 a.m. local time

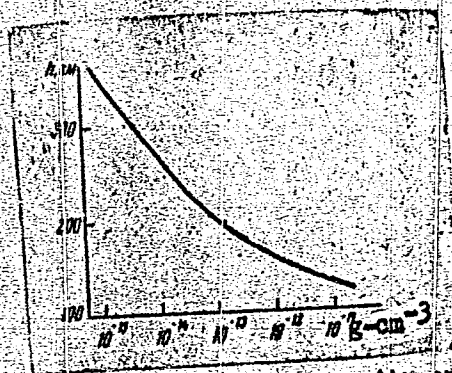


Fig. 3. Atmospheric density on 18 June 1963, at 4:30 a.m. local time

Card 4/4



ACC NR: AP6020996

SOURCE CODE: PO/0101/66/000/010/0001/0009

AUTHOR: Parfianowicz, Grzegorz (Master engineer)

ORG: none

TITLE: Polish board instruments for gliders

SOURCE: Warsaw. Instytut lotnictwa. Biuletyn informacyjny, no. 10, 1966, 1-9

TOPIC TAGS: aircraft <sup>flight</sup> instrument, instrumentation, glider

ABSTRACT: The discussion covers special requirements for instruments used on gliders, the historical development of such apparatus in Poland and the design and specifications of some instruments, including the vane variometers WRs-30 and WRs-5 and the total energy compensator WKEC-1 for the latter instrument, electrical direction meters ZS-1, EZS-1, and EZS-2, artificial horizons SHS-1, SHS-2, and SHA-1, their gyro and compensating systems and the transistorized converter PT-1, magnetic compass BS-1, and the oxygen apparatus SAT-5. Planned improvements of existing instruments are briefly discussed. Orig. art. has: 2 tables and 16 figures.

SUB CODE: 01/ SUBM DATE: none

Card 1/1

PYATIKOP, A.I., dotsent; BEZNOS, T.I., kand.med.nauk; LYUBETSKAYA, R.Ya.;  
PARFILO, A.V.; YUKHNOVSKAYA, Ye.N.

Treatment of fungous skin diseases with griseofulvin. Vest. dermat.  
i ven. 38 no.4:47-50 Ap '64. (MIRA 18:4)

1. Ukrainskiy nauchno-issledovatel'skiy kozhno-venerologicheskii  
institut (dir. - dotsent A.I.Pyatikop).

PARFILOVA, M. E.

PARFILOVA, M. E. "Rust on Fir in Carpathian Mountain Forests," Lesnoe Khoziaistvo, vol. 5, no. 12, 1952, pp. 74-75. 59.8  
15622

SO: SIRA SI-90-53, 15 Dec. 1953

1. M. E. PARFILOVA
2. USSR (600)
4. Carpathian Mountains - Uredineae
7. fir rust (*Melampsorella cerastii* Wint.) in the forests of Carpathaia. Les. khoz. 5 no. 12. 1952.
9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

PARFILOVA, M. YE

USSR/Chemical Technology - Chemical Products and Their Applications -- Pesticides. I-7

Abs Jour : Ref Zhur - Khimiya, No 3, 1957, 8862

Author : Parfilova, M.Ye.

Inst : ~~L'vov~~ Agricultural Institute

Title : The Effectiveness of the Application of Copper Oxychloride Dust in the Control of Tomato Diseases.

Orig Pub : Nauch. zap. L'vovsk. s.-kh. in-ta, 1955, 5, 172-175

Abstract : Copper oxychloride dust (I) is more effective against septoria, macrosporiosis of the leaves and fruit, phytophthorosis ~~(sic)~~, top and water rot of tomatoes than Bordeaux liquid. Treatment with I increases the amount of malonic and ascorbic acids in the fruit as compared to the control plants.

Card 1/1

1. PARFILOVA, M. YE.
2. USSR (600)
4. Uredineae-Carpathian Mountains.
7. Fir rust (*Melampsorella cerastii* Wint.) in the forests of Carpathia.  
Les. khoz. 5 No. 12, 1952.
9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

PARFILOVA, M.Ye., dots.

Effectiveness of new chemicals in controlling tomato diseases.  
Zashch. rast. ot vred. i bol. 3 no.4:33 J1-Ag '58. (MIRA 11:9)

1. L'vovskiy sel'skokhozyaystvennyy institut.  
(Tomatoes--Diseases and pests)

PAFFENBARGER, J.

Before the expected reorganization of agricultural establishments.

1. 93 (IRLÉPOLAR (Ireland)) Ireland, Vol. 13, No. 3, Mar. 1967

20: Monthly Index of European Accessions (A-12) Vol. 6, no. 11, November 1967



PARFINIEWICZ, L.

Deficiencies and qualities of the table of work standards used in the  
agricultural planning activities. p. 379.  
PREZEBLAD GEODEZYJNY. (Zwiazdk Nierniczych Rzeczypospolitej. Polskiej)  
Warszawa. Vol. 11, no. 11, Nov. 1955.

So. East European Accessions List. Vol. 5, no. 1, Jan. 1956

PARFINIEWICZ, L.

PARFINIEWICZ, L. Competition in agricultural planning. p. 324.

Vol. 12, no. 9, Sept. 1956

PRZEGLAD GEODEZYJNY

SCIENCE

Poland

So: East European Accession, Vol. 6, No. 5, May 1957

PARFINIEWICZ, L.

PARFINIEWICZ, L.

Theoretical or practical elaboration of plans for the organization of agricultural lands for collective farms, p. 33. (PRZEGLAD GEODEZYJNY, Warszawa, Vol. 11, no. 2, Feb. 1955.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 4, Jan. 1955, Uncl.

PARFINIEWICZ, L.

Means of increasing labor productivity through the organisation of agricultural  
lands of collective farms. p. 81.  
(PRZEGLAD GEODEZYJNY Vol. 12, no. 3, Mar. 1956) Warsaw, Poland

SO: Monthly List of East European Accessions (EEAL) LC, Vol. 6, No. 9 Sept. 1957 Uncl.

PARFINIEWICZ, L.

"Standardization in Agricultural Management." P. 132, (P Z GLA.  
GEODEZYJNY, Vol. 10, No. 5, May 1954. Warszawa, Poland.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 3,  
No. 12, Dec. 1954, Uncl.

PARFINIEWICZ, L.

"Surveyors or compulsory workers must help in surveying the land". p.358.  
(PRZEGLAD GEODEZYJNY Vol. 10, No. 12, Dec. 1954. Warszawa, Poland)

SO: Monthly List of East European Accessions. (EEAL). LC. Vol. 4, No. 4,  
April 1955. Uncl.

29 (0)

CHICOM/32-59-37-24/29

AUTHOR: V. Parfinov

TITLE: The First Inter-Planetary Station<sup>1</sup>

PERIODICAL: K'io Hsueh Hsin Wen, 1959, Nr 37, p 20

ABSTRACT: This is a translation of an article released by the Information Office of the Soviet Embassy concerning Lunik III. ✓

Card 1/1

Parfionovas, V.

Use of hydraulic lime for production of autoclave-hardened silica ware. V. Siliza and V. Parfionovas, *Lietuvos TSR Mokslu Akad. Darbai, Ser. B* 1957, No. 3, 33-49 (in Russian; Lithuanian summary, 50).—The possibility of production of autoclave-hardened silica ware, by using hydraulic lime obtained from chalky marl of Valkininkai by 2-hr. calcining at 930-50, was investigated. It was established that silica wares prepregged with hydraulic lime as a binder are of sufficient strength. This strength is acquired on hydrothermal hardening of articles previously compressed under 150-250 kg./sq. cm., and depends not only on hydration of dicalcium silicate and monocalcium aluminate, but also on the newly formed hydrates of Ca silicate produced by the interaction of free CaO with quartz sand. Thus, the presence of 18-27% of free CaO in the hydraulic lime used was found essential to the strength of the articles produced. It was also established that the addn. of finely dispersed clay or chalky marl sharply increases the mech. strength of raw and hardened silica ware. Thus, samples composed of 10% hydraulic lime contg. 26.96% of free CaO and 90% sand, mixed with 10% water, compressed to 200 kg./sq.

3



*PARFIONOVAS, V.*

PARFIONOVAS, V.

Local binders based on the chalk marl of the Valkinnkai area. In Russian.

p. 41 (Lechemas, Gersonas) No. 2, 1957, Vilnius, Lithuania

SO: MONTHLY INDEX OF EAST EUROPEAN ACCESSIONS (EEAI) LC, VOL. 7, NO. 1, JAN. 1958

L 45382-65 EWT(m)/EPF(c)/EPF(n)-2/EWG(m)/EPR/I/EPA(bb)-2/ Pr-4/PS-4/Pu-4 DM

ACCESSION NR: AP5009132

S/0089/65/010/003/0302/0302

AUTHOR: Kubrochenko, A.; Parfir'yev, V.

TITLE: Physical start of VK-50 boiling-water reactor at the Ul'yanovsk Atomic Power Station

SOURCE: Atomnaya energiya, v. 18, no. 3, 1965, 302

TOPIC TAGS: boiling water reactor, steam water reactor, power reactor/ VK-50

ABSTRACT: The reactor of the Ul'yanovsk Atomic Power Station was started in December 1964 at the Nauchno-issledovatel'skiy institut atomnykh reaktorov (Scientific Research Institute of Atomic Reactors) in Melekess, Ul'yanovsk oblast. The results of investigations of physical characteristics of the active zone of the reactor confirmed the correctness of the physical calculations. This is an experimental boiling-water power reactor producing 70 MW of electric power and 250 MW of thermal power. Natural circulation cooling is used, the steam-water mixture produced in the active zone being separated after leaving the active zone, with the saturated steam dried in separators and fed to the turbine. Circulation is

Card 1/2